

## Remarks

Claims 1-21 and 23-24 are pending. Claim 22 was previously withdrawn.

### CLAIM REJECTIONS – 35 U.S.C. §103

(a) Claims 1, 4, 21, 23, and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Holton *et al* (US 5,381,512), hereinafter "Holton", in view of Ren *et al* (US 5,776,179). Applicant respectfully traverses.

#### CLAIM 1 (21)

First, Applicant respectfully submits that Holton does not disclose "an inner hair cleft contents map over time" as the Examiner contends on page 2, penultimate paragraph of the Office Action. All Figures cited by the Examiner only show a channel centre frequency over time such as in Fig. 2a, 2b, 9, 11, 14, and 16. A frequency is definitely not a "cleft content", and Claim 1 explicitly and clearly requires a cleft contents map. Furthermore, Claim 1, clearly requires that there is a "transmitter substance inside a cleft" so that the "cleft content" corresponds to the "transmitter substance inside a cleft" as clearly defined in Claim 1. One skilled in the art would recognize that, definitely, a sensor channel frequency over time is different from a cleft content map or is different from a transmitter substance inside the cleft.

Furthermore, the Examiner points to column 24, line 54 to column 26, line 32. Although this passage discloses an ear model and, specifically the Meddis ear model, as outlined in column 24, line 66, this passage does not disclose an "inner hair cell cleft contents map over time", as claimed.

Furthermore, and this is already acknowledged by the Examiner, Holton does not disclose "an inner hair cell cleft contents map over frequency and over time".

Furthermore, Holton is completely silent about hair cells having a lower order indicating lower frequencies and a higher order indicating higher frequencies. Moreover, very

significantly, a cleft contents map, *i.e.* a map illustrating the cleft content over frequency and over time is not at all disclosed anywhere in Holton whatsoever.

Again, all the graphs cited by the Examiner are channel centre frequency drafts and are not related to any cleft content.

Furthermore, Holton also does not disclose a pitch analyzer for analyzing the cleft contents map, because Holton is completely silent on a cleft contents map. Stated another way, when Holton does not disclose a cleft contents map as defined in Claim 1, then it automatically follows that Holton can not possibly disclose a pitch analyzer for analyzing this map.

Furthermore, Holton is completely silent about a pitch line. The Examiner points to Fig. 2A as showing the pitch line, however, this is incorrect. Column 7 clearly says that Fig. 2A is a plot of the response wave forms generated by the peripheral auditory filtering stage 108 of Fig. 1. Further, column 7, lines 55-57, clearly say that the output of stage 108 is an array of sequences 110 which represent the probability density functions of discharge of the primary afferent auditory-nerve fibers, where the channel number  $k$  represents the spatial dimension of the response. This underlines the fact that Fig. 2A does not have a cleft contents map, but sequences representing the probability density functions of discharge.

Furthermore, Holton mentions "channel centre frequencies" under y-axis in Fig. 2A, but it is unclear which channels are meant. For the sake of expedient prosecution Applicant assumes that each sequence  $\lambda_1[n]$  is a channel, because each sequence corresponds to the probability density function of discharge of a specific auditory-nerve fiber. And, significantly, column 8, lines 9-13, clearly related to Fig. 2A states the following sentence:

"One of the principal features of this invention is that linguistically important speech features such as the location of the glottal pulses and formant frequencies can be determined by designing robust detectors ...."

In its own, it is clear that this passage does not have any relation to any pitch. Even in view of the Examiner's assertions in the "Response to Arguments" section, it is clear that

this passage does not have any relation to any pitch. Moreover, the purpose of Fig. 2A is not to find a channel centre frequency. In fact, this channel centre frequency is predetermined by the sequence or the nerve. Instead, certain patterns are to be found in Fig. 2A. Thus, for the Examiner to say that Fig. 2A represents a frequency analysis is technically incorrect. Instead, the purpose of Fig. 2A is not to find a certain frequency, because the frequencies are given in the y-axis, but the purpose of Fig. 2A is to locate an impulsive epoch 202 and a synchronous epoch as outlined in column 8, lines 2 and 3. Therefore, Fig. 2A does not represent a pitch analyzer to obtain a pitch line over time.

Should the Examiner nevertheless maintain his position, Applicant respectfully requests that the Examiner clearly indicate where, in any of the many cited figures, a pitch line over time can be found or identify where there is even a frequency in the analysis of the input sound waves. Instead, it is the purpose to find certain patterns in the array of sequences 110 as outlined in column 7, lines 53-55, and, significantly, the sequences do not represent an inner hair cell cleft contents map, but represent, as outlined in column 7, lines 55-57, "probability density functions of discharge of the primary afferent auditory-nerve fibers".

Therefore, the Examiner's analysis with respect to the ear model and with respect to the pitch analyzer is incorrect.

Regarding Ren, the Examiner points to Figs. 14 and 16. Although Figs. 14-16 illustrate a three-dimensional graph, the third coordinate, *i.e.*, the vertical coordinate, is a "sound level" in Fig. 14, and "amplitude" in Fig. 15, and "amplitude" in Fig. 16. Significantly, one skilled in the art would readily recognize that a sound level or an amplitude is definitely not a "inner hair cell cleft contents map". This is because, in the cleft, there is a time-varying concentration of a transmitter substance, but not a sound level or an amplitude. Therefore, although Figs. 14-16 are three-dimensional diagrams, these diagrams are the sound level over frequency and time or an amplitude over frequency and time.

Furthermore and significantly, the Examiner's attention is drawn to column 12, lines 52-54, where it is emphasized that the sound level illustrated in Fig. 14 as "EEOE" (see column 14, line 12) means "electrically-evoked otoacoustic emissions". A three-dimensional graph of an electrically-evoked otoacoustic emission is definitely different

from "an estimated inner hair cell cleft contents map" as explicitly recited in Claim 1. Respectfully, Applicant is at a loss as to why the Examiner states on page 3, 5<sup>th</sup> line that "Ren further teaches estimating inner hair cell cleft contents map over frequency and over time". Figs. 14-16 are EEOE and not inner hair cell cleft content.

Furthermore, regarding the additional notes on page 3, 1<sup>st</sup> paragraph, second half, of the Office Action, Applicant's opinion is that the passage in column 9 and column 10 simply describes the functionality of an ear. This passage does not have any relation whatsoever to a "pitch analyzer" as recited in Claim 1, which is a portion of a "hardware apparatus for analyzing" as outlined in the first line of Claim 1. The same is true for the passage in column 10, which also simply describes the functionality of the human ear but does not disclose or fairly suggest whatsoever anything with respect to a hardware apparatus.

Additionally, Applicant would like to draw attention to page 3, second paragraph, second line of the Office Action, where it is stated that a "3D sound spectrum as taught by Ren". Applicant would like to point out that there appears to be a contradiction as the Examiner states one paragraph above that this is a "inner hair cell cleft contents map" which is different from a 3D sound spectrum.

Further, it makes no sense to combine Ren with Holton. A sound spectrum in Ren does not make any sense compared to Fig. 2A of Holton which is, as outlined, an array of sequences representing probability density functions of discharge. Thus, we have the following:

In Holton, probability density functions.

In Ren, a 3D sound spectrum (EEOE).

But, Claim 1 requires an "estimated inner hair cell cleft contents map over frequency and over time". Therefore, the references are completely different from Claim 1.

Thus, in view of the argument above, it has been shown that neither cited reference, alone or even in combination, disclose or fairly suggest Claims 1 and 21. Removal of the rejection and reconsideration are respectfully requested.

## DEPENDENT CLAIMS

The dependent claims depend directly or indirectly from the claims that have been discussed. Therefore, those claims are deemed patentable for the reasons given above. In addition, each of the dependent claims separately introduces features that independently render the claim patentable. However, due to the fundamental differences already identified, and to expedite positive resolution of the examination, separate arguments are not provided for each of the dependent claims at this time. Removal of the rejection and reconsideration are respectfully requested.

(b) Claims 2, 9-16, and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Holton, in view of Ren and Herre *et al* (US 2004/0068401 A1). Applicant respectfully traverses.

Claims 2, 9-16, and 20 depend directly or indirectly from the claims that have been discussed. Therefore, those claims are deemed patentable for the reasons given above. In addition, each of the dependent claims separately introduces features that independently render the claim patentable. However, due to the fundamental differences already identified, and to expedite positive resolution of the examination, separate arguments are not provided for each of the dependent claims at this time. Removal of the rejection and reconsideration are respectfully requested.

(c) Claims 5-8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Holton in view of Ren and in view of Herre *et al* (US 2004/0094019 A1), hereinafter "Herre'019". Applicant respectfully traverses.

Claims 5-8 depend directly or indirectly from the claims that have been discussed. Therefore, those claims are deemed patentable for the reasons given above. In addition, each of the dependent claims separately introduces features that independently render the claim patentable. However, due to the fundamental differences already identified, and to expedite positive resolution of the examination, separate arguments are not provided for each of the dependent claims at this time. Removal of the rejection and reconsideration are respectfully requested.

(d) Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Holton in view of Ren and Gilman (US 5,176,620). Applicant respectfully traverses.

Claim 3 depends directly from a claim that has been discussed. Therefore, Claim 3 is deemed patentable for the reasons given above. In addition, Claim 3 separately introduces features that independently render the claim patentable. However, due to the fundamental differences already identified, and to expedite positive resolution of the examination, separate arguments are not provided for Claim 3 at this time. Removal of the rejection and reconsideration are respectfully requested.

(e) Claims 17 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Holton in view of Ren and Hartley (US 5,417,113). Applicant respectfully traverses.

Claims 17 and 19 depend directly or indirectly from the claims that have been discussed. Therefore, those claims are deemed patentable for the reasons given above. In addition, each of the dependent claims separately introduces features that independently render the claim patentable. However, due to the fundamental differences already identified, and to expedite positive resolution of the examination, separate arguments are not provided for each of the dependent claims at this time. Removal of the rejection and reconsideration are respectfully requested.

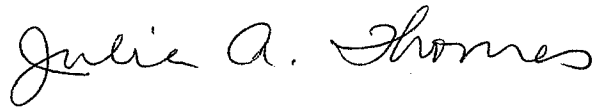
(f) Claim 18 is rejected under 35 U.S.C. §103(a) as being unpatentable over Holton in view of Ren, Hartley, and Blamey *et al* (US 2003/0171786 A1). Applicant respectfully traverses.

Claim 18 depends indirectly from a claim that has been discussed. Therefore, Claim 18 is deemed patentable for the reasons given above. In addition, Claim 18 separately introduces features that independently render the claim patentable. However, due to the fundamental differences already identified, and to expedite positive resolution of the examination, separate arguments are not provided for Claim 18 at this time. Removal of the rejection and reconsideration are respectfully requested.

CONCLUSION

In view of the above, Applicants respectfully posit that the pending claims are allowable. The Examiner is invited to please contact Applicant's agent of record at (650) 474-8400 should any questions arise.

Respectfully submitted,

A handwritten signature in cursive script that reads "Julie A. Thomas". The signature is written in dark ink and is positioned below the typed name.

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